

REMARKS/ARGUMENTS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested. Claims 16-59 are pending, Claims 16, 26, 30, and 35 having been amended and Claims 38-59 having been added by way of the present amendment.

New Claims 38-59 correspond with Claims 16-37, although describe that the shift of the center frequency is toward a higher or lower edge of the passband of the IF filter. Support for the present amendment is found in the specification, for example at page 6, lines 26-30. Therefore no new matter is added.

In the outstanding Office Action Claims 16-21, 26-28 and 31-37 are rejected as being unpatentable over Bach et al. (U.S. Patent 6,088,569, hereinafter Bach) in view of Furukawa et al. (U.S. Patent 6,363,126, hereinafter Furukawa); Claims 22 and 29 were rejected as being unpatentable over Bach in view of Furukawa and in further view of Roschmann et al. (U.S. Patent 5,305,347, hereinafter Roschmann); Claims 23 and 30 were rejected as being unpatentable over Bach in view of Furukawa in view of Roschmann and in further view of Lee (U.S. Patent 6,829,475); Claim 24 was rejected over Bach in view of Furukawa and in further view of Dwyer (U.S. Patent 5,970,400); Claim 25 was rejected as being unpatentable over Bach in view of Furukawa and in further view of Nash (U.S. Patent 6,317,589); and Claim 24 was rejected as being unpatentable over Bach in view of Furukawa and in further view of Dwyer.

In reply, Claim 16 has been amended merely to clarify the language contained therein. Moreover, Claim 16 was amended to clarify that the AM receiver is configured and adapted for adjusting said variable oscillation frequency on the basis of a feedback signal supplied downstream from the down-conversion stage in order to detune said unwanted center frequency of said wanted signal part relative to said center frequency of at least one IF filter.

As has been discussed in previous responses to Office Actions, the present invention is directed to an AM receiver that includes a feedback mechanism that adjusts the appropriate first intermediate frequency f_{IF1} based on a control signal that is supplied from the digital baseband processing stage 12. This feedback signal causes a desired signal that is occupied within a predetermined bandwidth (see, e.g., the “wanted signal” in Figure 2) to be shifted within the bandwidth of an analog filter (see, e.g., Figure 2). Purposely shifting the center frequency of the wanted signal allows for the removal of unwanted signals, which can bias an automatic gain control (AGC) circuit, thereby increasing the demands on the receiver to have improved dynamic range, etc. The use of the feedback signal is based on the present inventors’ recognition that analysis of the energy contained within the IF band pass filter can cause degradation in system performance if too much unwanted signal energy is contained therein. Thus, shifting (detuning) the desired signal within the IF filter will result in improved performance in baseband processing provided the unwanted signal parts are removed.

The outstanding Office Action relies on Bach as a primary reference. Bach as recognized in the outstanding Office Action does not describe the use of a feedback signal supplied downstream of the down conversion phase in order to adjust a detuning of the IF signal processing stage. As such, Bach explains that a controller 311 is in charge of determining the value of the local oscillator 1 signal based on (1) the frequency of the desired signal, (2) the desired signal frequency bandwidth, and (3) “other factors” (column 3, lines 27-31). These other factors include *a priori* features that are known in advance to an operator so the appropriate signal manipulation and filtering may be performed in the intermediate frequency stage. Moreover, controller 311 relies on “outside input” regarding features of the particular communication system to allow it to perform the appropriate filtering. This is so

because the object of Bach is to operate with transmitted signals that have a variety of frequency bandwidths (column 1, lines 27-29).

Moreover, the outstanding Office Action recognizes that Bach does not describe the feedback aspect of Claim 16, but rather relies on the teachings of Furukawa to cure this deficiency. The outstanding Office Action asserts that Furukawa discloses an AM receiver (this is believed to be in error since Furukawa describes a QPSK receiver, see QPSK modulated signal in as input in each of Figures 1-7). Furthermore, the outstanding Office Action asserts that Furukawa teaches adapting an adjustable variable oscillation frequency on the basis of a feedback signal supplied downstream from the down-conversion stage in order to “detune”. Applicants respectfully submit that this is not a proper characterization of Furukawa.

Furukawa is directed to compensating for “detuning”, caused by temperature variations (see, e.g., discussion at column 6, lines 10-20, for example). To achieve this goal Furukawa relies on feedback within a predetermined range calculated by an operator, such that an input modulated signal that is detuned as a result of temperature-induced frequency shift of the signal processing components, allows for the output signal frequency to settle within a control band thus preventing the input modulated signal from being cut off (see, e.g., column 6, lines 21-28). This feature of maintaining control of the positioning of the desired signal in Furukawa is critical because Furukawa relies on the intermediate frequency signal waveform to be shaped by a band pass filter 3 (see, e.g., column 5, lines 45-47). The use of these waveform shaping filters (column 5, lines 21-22) allows for the conversion of the data into I, Q baseband signals for appropriate signal detection. If the intermediate frequency signal waveform is not properly shaped by the band pass filters, then subsequent I, Q baseband signals processing will experience degraded signal detection (see, e.g., column 3, lines 61-65). Consequently, the purpose of Furukawa is exactly opposite that asserted in the

Office Action: Furukawa uses feedback to compensate for detuning, not purposely induce detuning.

Once again Claim 16 requires a down-conversion stage having a variable oscillation frequency which is adjustable to detune a wanted center frequency from a center frequency of at least one IF filter. The feedback system relied on in the Office Action, as described in Furukawa, actually teaches away from this claim element, by shifting local oscillator frequencies to offset a detuning effect caused by temperature induced frequency shifts in the receiver components. The goal of Furukawa is to position the intermediate frequency within the center of the band pass filter so it may be appropriately shaped prior to baseband conversion, which is exactly opposite to that which is claimed in Claim 16.

M.P.E.P. §2143 defines the basic requirements for a *prima facie* case of obviousness, one such requirement is the motivation or suggestion to modify the references as asserted in the outstanding Office Action. M.P.E.P. §2143.01V further describes that the proposed modification cannot render the prior art unsatisfactory for its intended purpose. This is precisely what is happening based on the asserted combination of Bach in view of Furukawa. Furukawa needs to perform frequency shifting in order to compensate for temperature induced frequency shifts caused by components. This re-centers the signal within the band pass filters to allow for appropriate shaping. Consequently, because the asserted modifications to Bach and Furukawa render the prior art references unfit for their intended purpose it is respectfully submitted that the outstanding Office Action has not created a *prima facie* case of obviousness with regard to amended Claim 16.

Although of differing scope and/or statutory class, it is respectfully submitted that Claims 17-21, 26-28 and 31-37 also patentably define over Bach in view of Furukawa for substantially the same reasons as discussed above with regard to Claim 16. Although Claims 22-25 and 29-30 are rejected on tertiary and quaternary references, it is respectfully submitted

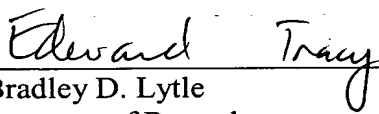
that these tertiary and quaternary references do not cure the deficiencies and limitations discussed above with regard to Claim 16.

Likewise, it is respectfully submitted that new Claims 38-59 also patentably define over the asserted prior art for substantially the same reasons as discussed above with regard to Claims 16-37.

Consequently, it is respectfully submitted that Claims 22-25 and 29-30 also patentably define over the asserted prior art. In view of the present amendment and in light of the foregoing comments, it is respectfully submitted that the invention defined by Claims 16-59, as amended, patentably defines over the asserted prior art. The present application is therefore believed to be in condition for formal allowance and an early and favorable reconsideration of this application is therefore requested.

Respectfully submitted,

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